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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,326	09/23/2003	Fang-Yu Yeh	11209-US-PA	2325
31561	7590	02/07/2005	EXAMINER	
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE 7 FLOOR-1, NO. 100 ROOSEVELT ROAD, SECTION 2 TAIPEI, 100 TAIWAN			SMOOT, STEPHEN W	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/605,326	Applicant(s) YEH ET AL.	
	Examiner Stephen W. Smoot	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-13 and 15-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11, 12, 16 and 19 is/are allowed.
- 6) ☒ Claim(s) 13, 15, 17, 18 and 23 is/are rejected.
- 7) ☒ Claim(s) 20-22 and 24-26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2003 and 23 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office action is in response to applicant's amendment filed on 23 November 2004.

Drawings

1. A replacement drawing sheet corresponding to Figs. 2F, 2G was received on 23 November 2004. These drawings are acceptable.

Specification

2. The disclosure is objected to because of the following informality:
In the Title, change "EMICONDUCTOR" to --SEMICONDUCTOR-- to correct spelling.

Claim Objections

3. Claims 15, 20-22 are objected to because of the following informalities:

In claim 15, line 1, change the claim dependency from "claim 14" to --claim 11-- because claim 14 has been cancelled; and

In claim 20, line 8, change "conductive" to --gate-- for proper antecedence to line 4; and

Claims 21-22 are objected to because they depend on claim 20.

Appropriate correction is required.

4. Claims 24, 26 are objected to under 37 CFR 1.75 as being substantial duplicates of claims 11, 16, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 13, 15, 17-18, 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites the limitation "the metal silicide layer" in line 3;

Claim 18 recites the limitation "the metal silicide layer" in line 3; and

Claim 23 recites the limitation "the metal silicide layer" in line 3.

There is insufficient antecedent basis for this limitation in claims 17-18, 23. The examiner notes that claims 17-18 would have proper antecedence for "the metal silicide layer" if their claim dependencies were changed to depend on claim 16 and claim 23 would have proper antecedence for "the metal silicide layer" if its claim dependency was changed to depend on claim 22.

Regarding claims 13, 15, a broad limitation together with a narrow limitation that falls within the broad limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired.

Claim 13 recites the broad recitation "comprises nitrogen ions" (in line 2) and the claim also recites "implanting nitrogen ions" (in claim 11, line 5), which is the narrower statement of the limitation; and

Claim 15 recites the broad recitation "comprises oxygen ions or argon ions" (in lines 2-3) and the claim also recites "implanting oxygen or argon ions" (in claim 11, line 6), which is the narrower statement of the limitation.

Allowable Subject Matter

7. Claims 11-12, 16, 19 are allowed.

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8. Claims 20-22 would be allowable if rewritten or amended to overcome the objection to claim 20 that is set forth in this Office action.

9. Claim 25 is objected to as being dependent upon an objected to base claim, but would be allowable if rewritten in independent form to include all of the limitations of claim 24.

10. The following is a statement of reasons for the indication of allowable subject matter:

- Claims 11-12, 16, 19 are allowed and claim 25 would be allowable because the prior art of record does not teach or suggest, in combination with the other claim limitations, a method of manufacturing a semiconductor device that includes an ion implantation step of either implanting nitrogen ions into sidewalls of gate structures or implanting oxygen or argon ions into portions of exposed substrate between the gate structures, combined with a subsequent thermal processing step to form a liner layer on the sidewalls and on the exposed substrate, wherein the thickness of the liner layer on the sidewalls is less than the thickness of the liner layer on the exposed substrate;
- Claims 20-22 would be allowable because the prior art of record does not teach or suggest, in combination with the other claim limitations, a method of manufacturing a semiconductor device that includes an ion implantation step of implanting ions into portions of exposed substrate between gate structures,

combined with a subsequent thermal processing step to form a liner layer on sidewalls of the gate structures and on the exposed substrate, wherein the thickness of the liner layer on the sidewalls is less than the thickness of the liner layer on the exposed substrate.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Su et al. teach tilt angle nitrogen implantation of gate stacks. Goto et al. teach argon implantation of a portion of a gate insulator region to enhance growth during a subsequent thermal oxidation step.

12. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00 am to 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SWS

Stephen W. Smoot
Patent Examiner
Art Unit 2813